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CHDS alumnus Leonard Guercia, right, and business partner Robert Holdsworth are longtime EMS veterans.

Center for Homeland Defense and Security master's degree graduate Leonard Guercia and his team watched with great interest as the 2014 Ebola scare roiled the health community, in particularly EMS workers charged with transporting potentially infected patients.

Working for the private company Ambulance Protection System that includes fellow EMS veterans, Guercia and company developed a now patented system that can quickly shield emergency vehicles and workers from infectious diseases.

Named "Biocell," Guercia likens the device to a sort of sandwich baggie for protecting the ambulance from the spread of infectious disease. A pre-cut lining designed to federal standards and equipped with clips seals the ambulance from contaminated patients and equipment as well.

Call it one of those "why didn't somebody think of that sooner" kind of inventions. The traditional method involved hurriedly cutting a tarp to be situated by hand and duct tape – a process that kept patients waiting.

"During the Ebola outbreak in early 2014 our team was reading and watching the transport of suspected patients both nationally and in our state," Guercia said. "The protection required EMS providers to take hours to protect the interior of their vehicles. This process was taking in excess of two hours."

Guercia was formerly the Chief Executive Officer of the Connecticut Department of Public Health who has 30 years of EMS experience. He and another EMS veteran, Robert Holdsworth formed the company earlier this year. Guercia's graduated from CHDS in 2011 with his thesis titled "Integration of Training Civilian and Military Disaster Responders."

Biocell enables EMS professionals to seal an ambulance in about 20 minutes, providing critical time savings. The importance of protecting ambulance surfaces, tools and workers from viruses was illustrated in Dallas in September 2014, during the height of the mania surrounding Ebola. An ambulance team had worn protective gear to transport an infected patient, but did not line the vehicle nor immediately wash it before responding to subsequent calls over the following 48-hour period, according to the New York Daily News. Consequently, patients transported before the cleaning had to be quarantined for 21 days.

“During the care of infectious diseases patients who are suffering from illness that are susceptible to easy transmission to others, it is imperative to keep these germs contain,” Guercia noted. “In some cases infectious material can live on inanimate surfaces such as the interior of an ambulance. Biocell keeps the spread of these infectious materials contained.”

Guercia and his business partner worked with an attorney and a plastics engineer in seeking the patent after testing a couple of prototypes. They also solicited feedback from EMS and fire chiefs they knew in Connecticut and New Jersey. With those years of experience Guercia has seen numerous biological and chemical threats, from the anthrax scares of the early 2000s to bird flu to Ebola.

The North Branford Fire Department in Connecticut was the first agency to implement the Biocell, according to WTNH News.

“It’s a major breakthrough in a very inexpensive and most effective way to protect personnel and vehicles, dealing not only with hazardous materials exposure but the consequences of Ebola, MERS and SARS,” Fire Chief Bill Seward told the station.

A CHDS master’s degree education was valuable both in terms of building the device and in the rigorous paperwork required to seek a patent, Guercia noted.

“The entire process involved meetings and conference calls with a free flow of ideas amongst the team members,” he said. “Many of these session reminded of our discussion during my time at NPS. Every person’s input was respected, but often times with a bit of sarcasm.”

The writing and research courses were pertinent as Guercia wrote on the technical aspects in the patent applications. He also cited as beneficial the Critical Infrastructure Protection course taught by former CHDS Executive Director Ted Lewis. Lewis wrote extensively on how nodes affect entire networks. Guercia applied that to EMS care, noting failing to properly disinfect patients and equipment could infect emergency room staff and conceivably close a hospital.

“That helped me as I looked at connectivity of the EMS component to the hospital,” Guercia said.